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ABSTRACT

This manual is designed to provide ready access to information about the industrial education program in Alberta to junior and senior high school teachers, counselors, and administrators. The manual is organized in 10 sections. The first three sections introduce the concept of industrial education, define it, and set forth the objectives of the program. In the fourth section, the organization of an industrial education program in junior and senior high school is explained. Sections V and VI provide course descriptions for the courses included in the industrial education program (electricity-electronics and computer, materials, power, visual communications, general, graphic communications, mechanics, construction and fabrication, electricity-electronics, personal services, and horticulture), and the courses related to industrial education (production science and work experience), while the following section discusses safety. Organization for teaching is the subject of the eighth section; grants and guidelines for academic-occupational programs for students who cannot keep up with the regular program occupy the final sections. (KC)

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TABLE OF CONTENTS

		Page
	PREFACE	iii
I.	INTRODUCTION	1
II.	INDUSTRIAL EDUCATION - DEFINITION	2
III.	OBJECTIVES	2
	A. Goals of Schooling	4
	B. Goals of Education	5
	C. Objectives of Industrial Education	6
	1. Personal Growth	6
	2. Career Exploration	7
	3. Occupational Skills	7
IV.	PROGRAM ORGANIZATION	8
	A. Elementary School	8
	B. Junior High School Industrial Education	8
	1. Fields of Study	9
	2. Content	10
	C. Industrial Education 10, 20, 30 Program	12
	D. Industrial Education 12, 22, 32 Program	14
	1. Flexibility and Scheduling	14
	2. Student Prerequisites	17
	3. Articulation	24
	a. Institutes of Technology	24
	b. Apprenticeship Branch	24
V.	DESCRIPTION OF COURSES	27
	1. Industrial Education 10, 20, 30	27
	A. Electricity-Electronics and Computer	27
	B. Materials	28
	C. Power	30
	D. Visual Communications	31
	E. General	33

Page

2. Industrial Education 12, 22, 32 Course Description . . 34

A. Graphic Communications 34

a. Drafting 34
b. Graphic Arts 35
c. Visual Communications 36

B. Mechanics 37

a. Auto Body 37
b. Automotives 38
c. Related Mechanics 39

C. Construction and Fabrication 40

a. Building Construction 40
b. Machine Shop 41
c. Welding 42
d. Piping 43
e. Sheet Metal 43

D. Electricity-Electronics 44

a. Electricity 44
b. Electronics 45

E. Personal Services 46

a. Beauty Culture 46
b. Food Preparation 47
c. Health Services 48

F. Horticulture 49

VI. COURSES RELATED TO INDUSTRIAL EDUCATION 50

A. Production Science 30 50
B. Work Experience 15, 25, 35 50

VII. SAFETY 51

VIII. ORGANIZATION FOR TEACHING 51

A. Teacher Qualifications 51
B. Facility Standards 52

IX. GRANTS 52

X. ACADEMIC-OCCUPATIONAL PROGRAM GUIDELINES 53

PREFACE

The purpose of this manual is to provide ready access to information concerning the Industrial Education program.

Counsellors should find the Industrial Education program organization, with the matrix defining major, minor and related areas, useful in helping students plan their total program.

Administrators should find the document useful in helping them understand the purpose of Industrial Education within the context of their system and then to plan ways of making it functional.

Regional Office Consultants in Calgary and Edmonton are available to help with specific planning and up-dating of information.

INDUSTRIAL EDUCATION MANUAL

I. INTRODUCTION

Industrial Education has in the past decade added a new dimension to the program for educating young people at the secondary school level. For many students it has opened new options to help prepare them for the life ahead while enjoying their studies now. The authors of the Industrial Education curriculum recognize that the needs of society have changed and with them the approach to knowledge acquirement. Students today must be helped to learn how to learn, to conduct inquiry, to study independently, to make choices and decisions, to use technology, and to live with change.

The Industrial Education program is concerned with career development. Because careers today do not develop along predictable lines our education program must provide considerable flexibility so that students have an option of several career choices. This is possible for several reasons. A person who has been broadly educated is able to learn what he needs to know, within limitations, about a new job. With the general education level of society rising, the future worker needs a broad as well as experience based education. Such an education offers students subsequent chances for rapid and successful specialization. With this in mind the learning experiences should be such that they become the basis upon which specialization can be built.

Our task in the secondary school then, is to provide students not only with entry skills for several careers but to orient the program to meet social and cultural goals. This means that the various courses or disciplines must be interrelated. Industrial Education provides a unique opportunity for the teacher to demonstrate these relationships and further the goals of Industrial Education by means of the motivation created through practical applications. Thus the experiences students are exposed to should provide them with realistic criteria for career guidance.

This manual will outline the goals of Industrial Education and suggest procedures and ideas to help students achieve them.

II. INDUSTRIAL EDUCATION - DEFINITION

Industrial Education is a program consisting of courses that provide a continuum of experiences, starting with exploratory experiences and activities in the elementary and junior high school, expanding in the high school to the development of skills in career fields, and culminating in on-the-job experience.

Industrial Education at the junior high school, the exploratory phase of the continuum, provides the opportunity for the students to explore, reason, experiment and discover the reality of the technological society in which they live. The content of the program deals with industry, its organization, materials, processes, products, occupations, and the problems resulting from the impact of technology on society.

Following the exploratory phase, students may begin orientation studies in a career field. They may select courses of a more general nature in the Industrial Education 10 series or alternately take an introductory 12 course related directly to a career field. From here they advance to the more specific courses in the Industrial Education program which prepare them for a career. Chart 1 on page 3 illustrates the Industrial Education program in conceptual form showing the advancement of a student from the awareness or familiarization stage to exploration, orientation, preparation, material processes, drawing and interpretation and a knowledge of the basic concepts related to the technologies. All the courses place emphasis on practical work and applied theory.

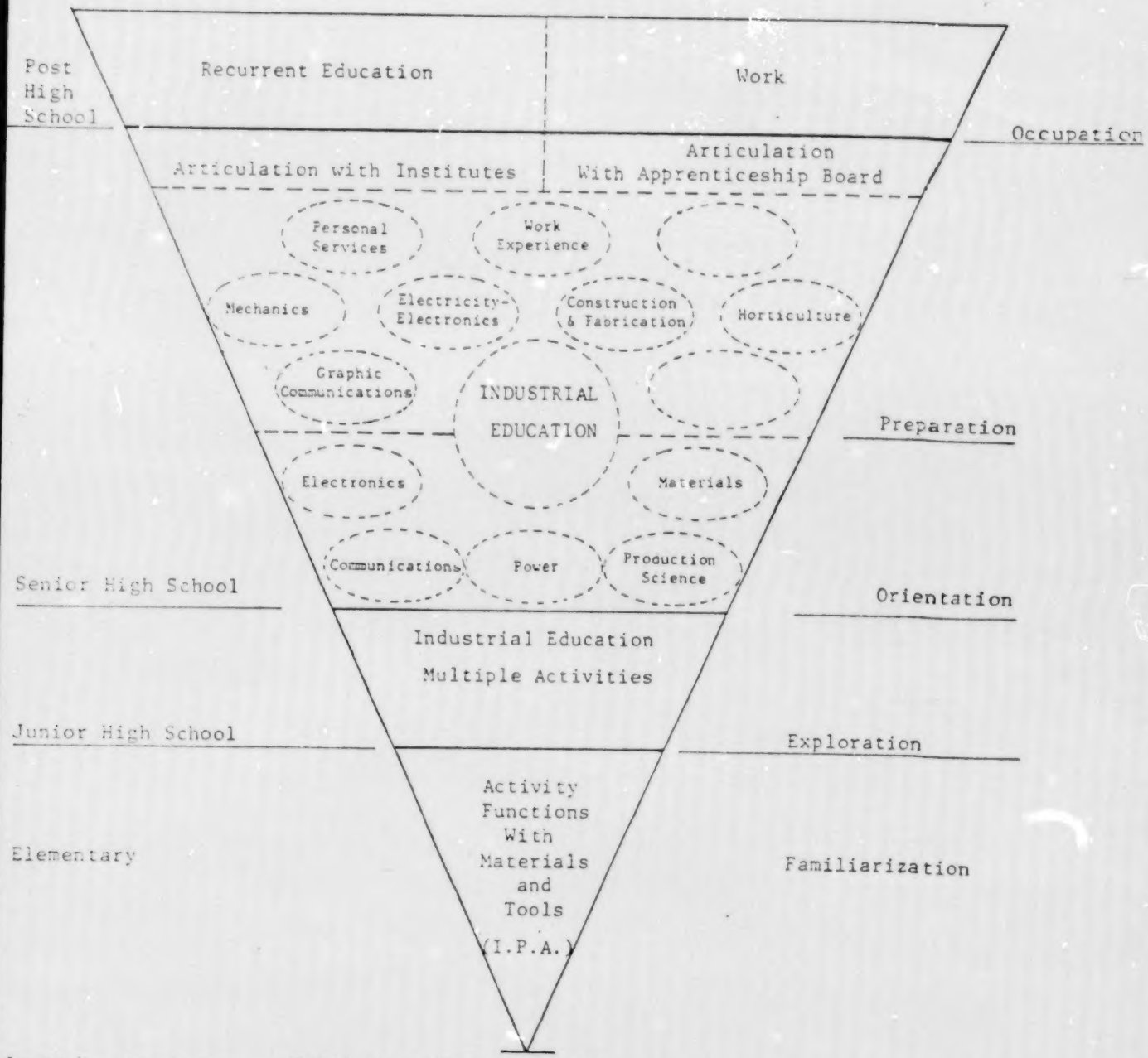
III. OBJECTIVES

The educational programs in our schools must give students an opportunity to start a life plan - a plan that prepares them for coping with their needs immediately following school, yet at the same time allowing considerable opportunity to diversify their choice of career options. The Industrial Education program provides such options through the introduction of courses that can be sequenced in a number of patterns. Such a program capitalizes on the student's interests while adding relevance to the tool subjects such as mathematics, science and English.

ALBERTA INDUSTRIAL EDUCATION PROGRAM

FOR

CAREER CHOICE AND DEVELOPMENT



Legend: ———— Solid line indicates levels

---------- Broken lines and open spaces indicate opportunity to transfer to other options

The development of positive attitudes to craftmanship, work and the fellow worker are all important responsibilities shared by the schools.

While the school makes a very important contribution to education, it is only one of the agencies involved in the education of youth. The home, the church, the media and community organizations are also very significant influences on children. It is useful to delimit the role of schooling and education. Education refers to all the learning experiences the individual has in interacting with the physical and social environment; it is a continuing and lifelong process. Schooling, which has a more limited purpose, refers to the learning activities planned and conducted by a formally structured agency which influences individuals during a specified period. There is, of course, a very close relationship between schooling and education - the learning which occurs in school influences and is influenced by what is learned outside the school.

A. GOALS OF SCHOOLING

Schooling, as part of education, accepts primary and distinctive responsibility for specific goals basic to the broader goals of education. Programs and activities shall be planned, taught and evaluated on the basis of these specific goals in order that students:

- Develop competencies in reading, writing, speaking, listening and viewing.
- Acquire basic knowledge and develop skills and attitudes in mathematics, the practical and fine arts, the sciences and the social studies (including history and geography) with appropriate local, national and international emphasis on each.
- Develop the learning skills of finding, organizing, analyzing, and applying information in a constructive and objective manner.
- Acquire knowledge and develop skills, attitudes and habits which contribute to physical, mental and social well-being.

- Develop an understanding of the meaning, responsibilities, and benefits of active citizenship at the local, national and international levels.
- Acquire knowledge and develop skills, attitudes and habits required to respond to the opportunities and expectations of the world of work.

Because the above goals are highly interrelated, each complementing and reinforcing the others, priority ranking among them is not suggested. It is recognized that in sequencing learning activities for students some goals are emphasized earlier than others; however, in relation to the total years of schooling, they are of equal importance.

In working toward the attainment of its goals, the school will strive for excellence. However, the degree of individual achievement also depends on student ability and motivation as well as support from the home. Completion of diploma requirements is expected to provide the graduate with basic preparation for lifelong learning. Dependent on program choices, the diploma also enables job entry of further formal study.

B. GOALS OF EDUCATION

Achievement of the broader goals of education must be viewed as a shared responsibility of the community. Maximum learning occurs when the efforts and expectations of various agencies affecting children complement each other. Recognizing the learning that has or has not occured through various community influences, among which the home is most important, the school will strive to:

- Develop intellectual curiosity and a desire for lifelong learning.
- Develop the ability to get along with people of varying backgrounds, beliefs and lifestyles.
- Develop a sense of community responsibility which embraces respect for law and authority, public and private property, and the rights of others.
- Develop self-discipline, self-understanding, and a positive self-concept through realistic appraisal of one's capabilities and limitations.

- Develop an appreciation for tradition and the ability to understand and respond to change as it occurs in personal life and in society.
- Develop skills for effective utilization of financial resources and leisure time and for constructive involvement in community endeavors.
- Develop an appreciation for the role of the family in society.
- Develop an interest in cultural and recreational pursuits.
- Develop a commitment to the careful use of natural resources and to the preservation and improvement of the physical environment.
- Develop a sense of purpose in life and ethical or spiritual values which respect the worth of the individual, justice, fair play and fundamental rights, responsibilities and freedoms.

The ultimate aim of education is to develop the abilities of the individual in order that he might fulfill his personal aspirations while making a positive contribution to society.

C. OBJECTIVES OF INDUSTRIAL EDUCATION

Courses in Industrial Education can help achieve the Goals of Schooling and Education. The program objectives are more focused and give direction to the teacher.

The objectives of Industrial Education are classified in three areas with the following purposes:

1. Personal Growth

To provide opportunities for the individual growth of the student through the development of acceptable personal and social values necessary in a productive society.

a. To provide a technical environment which motivates and stimulates individuals to discover their interests and develop personal and social responsibilities.

b. To assist in the development of positive attitudes toward safety.

c. To assist in the development of positive attitudes toward conservation and environment.

d. To assist in the development of consumer literacy.

2. Career Exploration

To provide students with experiences which will assist them in making realistic career choices.

a. To provide students an opportunity, within a technical environment to become acquainted with the general occupational characteristics of a variety of career fields.

b. To relate their own interests, abilities, likes, dislikes and values to several career fields.

3. Occupational Skills

To develop basic competencies, integrating cognitive and psychomotor skills related to families of occupations.

a. To provide safe exploratory experiences in the use of tools, energy, equipment and materials appropriate to various technologies prevalent in a productive society.

b. To develop an understanding of the interrelationships of various technologies.

c. To provide a technical environment which permits students to synthesize their accumulated knowledge in the solution of practical problems, and to assist students to develop habits that will be conducive to the establishment of a safe environment.

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IV. PROGRAM ORGANIZATION

A. ELEMENTARY SCHOOL

Industrial Education is not taught as a separate discipline at the elementary school level. Rather, the concepts of work, the use of tools and materials are integrated with all subject areas. The teaching strategy of "Integrated Practical Activities" (I.P.A.) was introduced in 1976 to help elementary teachers incorporate appropriate activities in a "learning by doing" environment. Each activity should be deliberately selected so that it reinforces a learning concept. The activity should be treated as part of a subject area, not as an entity by itself. Activities may and should cross many disciplines, integrating with existing subject areas.

B. JUNIOR HIGH SCHOOL INDUSTRIAL EDUCATION

The Alberta Multiple Activities Program is an organizational device through which a variety of technology-based, exploratory experiences can be presented in a minimum of space with a minimum of equipment. The laboratory is organized into a number of different areas representing components of the fields of study. Some Alberta school jurisdictions have opted to build separate laboratories representing each field of study (or a combination of one or more fields) rather than housing the entire program within a single laboratory. Each area within a laboratory is as self-contained as possible with provisions made for the storage of tools, products, and stock within it. The class is divided into three or more groups with each group working through the course content in the assigned area.

The modules, to be taught in nine to twelve weeks, are designed in such a way as to allow for adequate orientation, organization and planning time. Beginning lessons, demonstrations and introductory safety discussions are recognized as being an integral part of Industrial Education and as such require generous time allotment.

It is imperative that ample preplanning be done prior to attempting a multiple activities teaching approach.

1. Fields of Study

To provide for a breadth of exploratory experiences, the junior high industrial education program is divided into four fields of study which are further divided into fifteen modules. Each module represents fifteen to twenty-five hours of study. During the junior high school years it is recommended that a student study a minimum of three different modules each year. In junior high schools where Industrial Education is taught for two years only, it is recommended that four different modules per year be studied. In any case, it is recommended that a student participate in an Industrial Education program a total of two hundred and twenty-five hours averaged over the three years that the student is attending junior high school in Alberta.

Fields of Study	Modules
Power Technology	Power Mechanics
	Electricity
	Electronics
	Computer
Materials Technology	Woods
	Metals
	Plastics
	Earths
	Leather-Textiles
Graphic Communications Technology	Printing
	Photography
	Technical Drawing
Synthesizing	Industrial Simulation
	Student Contracting
	Developmental Research

2. Content

Materials Technology

Module 1. Woods

- sources of raw material, processing, environmental implications, identification, product planning, separation processes, forming processes, conditioning processes, combining processes, occupational information.

Module 2. Metals

- sources of raw material, processing, societal implications, identification of properties, product planning, separation processes, forming processes, conditioning processes, combining processes, occupational information.

Module 3. Plastics

- sources of raw material, processing, environmental implications, identification of properties, product planning, separation processes, forming processes, conditioning processes, combining processes, occupational information.

Module 4. Earths

- sources of ceramic and concrete materials, identification of processes, identification of properties, product planning, separation processes, forming processes, conditioning processes, combining processes, environmental implications, occupational information.

Module 5. Leather and Textiles

- sources of raw material, processing, identification of properties, product planning, separation processes, conditioning processes, forming processes, combining processes, environmental implications, occupational information.

Power Technology

Module 1. Power Mechanics

- small engines, analysis, troubleshooting, fluid power, control devices, transmission devices, output, environmental implications, occcupational information.

Module 2. Electricity

- basic theory, measurement, control magnetism, conversion of electrical energy, safety, troubleshooting, occupational information.

Module 3. Electronics

- basic theory, components, systems circuits, communications, occupational information.

Module 4. Computers

- computer "use", computer systems, programming, programs, societal implications, occupational information.

Graphic Communication Technology

Module 1. Printing

- lithography (offset), photo mechanical reproduction, relief printing (sign press - platen press), relief printing (rubber stamp), silk screen - photo silk screen.

Module 2. Photography

- camera (light sensitive materials), darkroom (processing film - prints), advanced darkroom, audio-visual.

Module 3. Technical Drawing

- freehand sketching, instrument drawing, drawing reproduction.

Synthesizing

Module 1. Industrial Simulation

- history, production systems, systems of ownership, organization, occupational information.

Module 2. Student Contracting

- opportunity for the student to develop greater competence in an area already explored, closed, modified and open contracts.

Module 3. Developmental Research

- opportunity for the teacher to develop new content, proposal and course writing.

C. INDUSTRIAL EDUCATION 10, 20, 30 PROGRAM

The Industrial Education program courses are identified as IE 10A, 20A, 30A, and IE 10B, 20B, and 30B.

The tens and twenties are 4-5 credits and the thirties are 5 credits.

The courses are made up of modules, each with a minimum of 25 hours of content and may be expanded to 33 hours. Three to five modules make up the requirements for 4-5 credits.

There are fifty-six modules to choose from with about an equal number from each of the career fields:

- Power
- Materials
- Graphic Communications
- Electricity-Electronics - Computer

Three modules of a general nature are also available. These are:

- Research
- Developmental Module
- Production Science Module

Specific programming is a local decision. If a cluster of modules in an area or career field is desired this can be scheduled. Sequencing, too, is left to the teacher and students insofar as content allows it.

Procedurally, students may register in four modules for a 4-5 credit course. The first four taken by a student will be registered as 10A. The next four modules could be called 20A and so on. If after having completed 13 to 15 credits the student wishes to continue, he/she may do so and the next course becomes 10B. An alternative would be to register in eight modules for ten credits and identify the courses as 10A and 10B. The "A" and "B" connotations have no significance other than to identify the sequence of modules. However, modules should not be repeated.

The Industrial Education 10, 20, 30 series is flexible and versatile, allowing schools with one or multiple laboratories to plan maximum use of their facilities.

The modules in the Industrial Education 10, 20, 30 program are listed on page 13.

1982 Revision

INDUSTRIAL EDUCATION 10, 20, 30 Matrix

(Each module is 25 to 33 hours in length)

CAREER FIELD

A. ELECTRICITY-ELECTRONICS (yellow package)	B. MATERIALS (green package)	C. POWER TECHNOLOGY (blue package)	D. VISUAL COMMUNICATIONS (orange package)
1. Basic Electricity and Electronics I	1. General Woods	1. Conventional Heat Engines	1. Introduction to Offset Lithography
2. Basic Electronics II	2. Building Construction (Frame)	2. Small Engine Repair	2. Process Photography - Line
3. Equipment Servicing	3. Building Construction (Sub-Trades)	3. Small Engine Tune-Up and Troubleshooting	3. Process Photography - Halftone
4. Logic Circuits	4. Cabinet Construction (Basic)	4. Mechanical Systems	4. Layout and Design
5. Computing Systems	5. Cabinet Construction (Advanced)	5. Non-conventional Power Sources	5. Topographical and Architectural Drafting
6. Introduction to Computers	6. General Metals	6. Electrical and Electronic Systems	6. Relief Printing
7. Computer Programming - Introductory	7. Sheet Metal	7. Electro Mechanical and Electionic Control	7. Screen Process Printing
8. Computer Programming - Industrial Applications	8. Machine Metal	8. Appliance Repair and Troubleshooting	8. Black and White Photography - Basic
9. Communications - Introductory	9. Arc Welding	9. Automobile Maintenance	9. Black and White Photography - Advanced
10. Communications - Systems	10. Oxy-Acetylene Welding	10. Fluid Power	10. Color Photography
11. Electronic Design	11. Foundry	11. Automobile Tune-up	11. Mechanical Drafting
12. Electronic Construction	12. Earths	12. Automobile Repair	12. Customer Service
	13. Plastics	13. Automobile Ownership	13. Offset Printing Production
	14. Textiles		
	15. Foods		

E. GENERAL MODULES

Three modules of a general nature also are available. These modules may be used by a student or group only once. These are;

1. Research module
2. Developmental Module
3. Production Science Module

D. INDUSTRIAL EDUCATION 12, 22, 32 PROGRAM

1. Flexibility and Scheduling

The Industrial Education 12, 22, 32 program is a series of modules which develop competencies leading to seven different career fields.

Entry into a career field may be gained by taking one of several introductory courses. These are:

a. the "12" course designated for each major, or

b. two modules from the Industrial Education "10, 20, 30" series related to the anticipated major, or

c. one half of a "12" course. The other half would be another half "12" or a module from the "10" program. The course would be recorded as Industrial Education "10".

Following the introductory course the student may advance to the major area of study by selecting any number of five credit modules from the courses designated as "22" or "32". The scheduling and sequencing of the modules is the responsibility of the local school personnel but must be in accordance with the regulations pertaining to prerequisites.

A student registered in a second or third level course ("22" or "32") is regarded as taking a major in that course area. Having established a major the student may select courses designated as minors and in this way broaden his practical skill base in a career field or even several career fields. However, students must complete all the preceding modules in a major series (usually six) before taking the 32C module (exceptions: Beauty Culture and Health Services).

The major and minor modules available in each career field and the provision for related studies make it possible to increase the options for the students.

The matrix, page 13, lists the entry level courses, the major areas of study for each career field and the related minors. In addition, a student may select courses from the Industrial Education 10, 20, 30 series, Business Education, Home Economics and/or Work Experience to supplement the career field.

Course modules, course sequences and prerequisites are shown in chart form on pages 18 and on.

Guidance counsellors and other school personnel providing educational guidance should acquaint students with the various options keeping in mind the requirements of continuity and sequence.

Each major (with three exceptions; Beauty Culture, Food Preparation and Health Services) has the equivalent of 35 - 40 credits available in six 5 - credit and one 5 or 10 credit block.

The specific methods used in programming the modules are left to the local school. Two examples will illustrate how schools may differ:

School A - Grade 10 students have a choice of four modules from the Industrial Education 10 course. Two of these modules should be in one field, e.g. mechanics, so that the student has the prerequisite 65 hours for the "22" course.

In grade 11 the students follow through on a major for 10 credits and a minor for 5 in the Industrial Education 22, 32 sequence.

In grade 12 the students continue with a major for 10 credits and a minor for 5. Such a program in Mechanics could be organized as follows over a three year sequence.

Level 1	Level 2	Level 3
Grade 10	Grade 11	Grade 12
Industrial Education 10	Automotives 22A	Automotives 32A (Major)
- Power Technology (2 modules)	Automotives 22B	Automotives 32B (Major)
- Machine Shop (1 module)	Welding 12 (Minor)	Electricity 12 (Minor)
- Drafting (1 module)		

School B - The students begin at Level One with a module of 5 credits. This is followed by two blocks of 10 credits each in Grades 11 and 12. In Grade 12 they may go into depth by taking an additional 10 credits in their major. Such a program in the field of Mechanics could be organized as follows:

Level 1	Level 2	Level 3
Grade 10	Grade 11	Grade 12
Mechanics 12	Automotives 22A	Automotives 22C
	Automotives 22B	Automotives 32A
		Automotives 32B
		Automotives 32C

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INDUSTRIAL EDUCATION MATRIX

November 1982

Career Development Courses

Exploratory Courses	Career Field	Industrial Education Introductory	Industrial Education Major	Industrial Education Minor	Related
Industrial Education and Home Economics at the Junior High Level	Graphic Communications	Drafting 12 Visual Communications 12 Industrial Education 10	Drafting Graphic Arts Visual Communications	Bldg. Const., Machine Shop, Electricity-Electronics, Welding Sheet Metal, Piping, Graphic Arts Visual Communications Drafting, Visual Communications Drafting, Graphic Arts	Work Experience Business Education Industrial Education
	Mechanics	Mechanics 12 Industrial Education 10 Auto Body 12	Automotives Related Mechanics Auto Body	Welding, Drafting, Machine Shop, Electricity, Auto Body Drafting Welding, Sheet Metal, Machine Shop, Automotives, Electricity	Work Experience Industrial Education Business Education
	Construction and Fabrication	Industrial Education 10 Building Construction 12 Machine Shop 12 Welding 12 Piping 12 Sheet Metal 12	Building Construction Machine Shop Welding Piping Sheet Metal	Drafting, Electricity, Sheet Metal, Piping, Machine Shop, Welding Drafting, Welding, Sheet Metal, Bldg. Const., Piping, Automotives, Auto Body Drafting, Machine Shop, Piping, Automotives, Auto Body, Bldg. Const., Sheet Metal Drafting, Bldg. Const., Welding Machine Shop, Electricity, Sheet Metal Auto Body, Drafting, Bldg. Const., Machine Shop, Welding, Piping, Electricity	Work Experience Industrial Education Business Education
	Electricity - Electronics	Electricity-Electronics 12 Industrial Education 10	Electricity Electronics	Automotives, Drafting, Bldg. Const., Electronics Drafting, Automotives, Bldg. Const., Electricity	Work Experience Business Education Industrial Education
	Personal Services	Industrial Education 10 Beauty Culture 12 Home Economics (Food Studies 10) Food Preparation 12 Health Services 12	Beauty Culture Food Preparation Health Services	Health Services, Food Preparation, Visual Communications Health Services, Visual Communications, Related Mechanics Beauty Culture, Food Preparation	Work Experience Industrial Education Business Education Home Economics
	Horticulture	Horticulture 12	Horticulture	Drafting, Automotives, Bldg. Const., Electricity, Related Mechanics, Piping	Work Experience Industrial Education Business Education

2. Student Prerequisites

The following charts indicate the normal prerequisites of a "12" course. In addition to that course, several other entries to the "22" program may be utilized. These are as follows:

a. A student wishing to establish a prerequisite to a 22 course must take two of three or four modules from a major area in the Industrial Education 10, 20, 30 five credit program.

e.g. Industrial Education 10 (5 credits)
- Power Technology (2 modules)
- Machine Shop (1 module)
- Mechanical Drafting (1 module) gives a prerequisite for a 22 course in Autobody, Automotives or Related Mechanics.

Industrial Education 10 (5 credits)
- Power Technology (2 modules)
- Materials (2 modules in Welding) gives prerequisite for a 22 course in Autobody, Automotives, Related Mechanics plus a prerequisite for a 22 course in Welding.

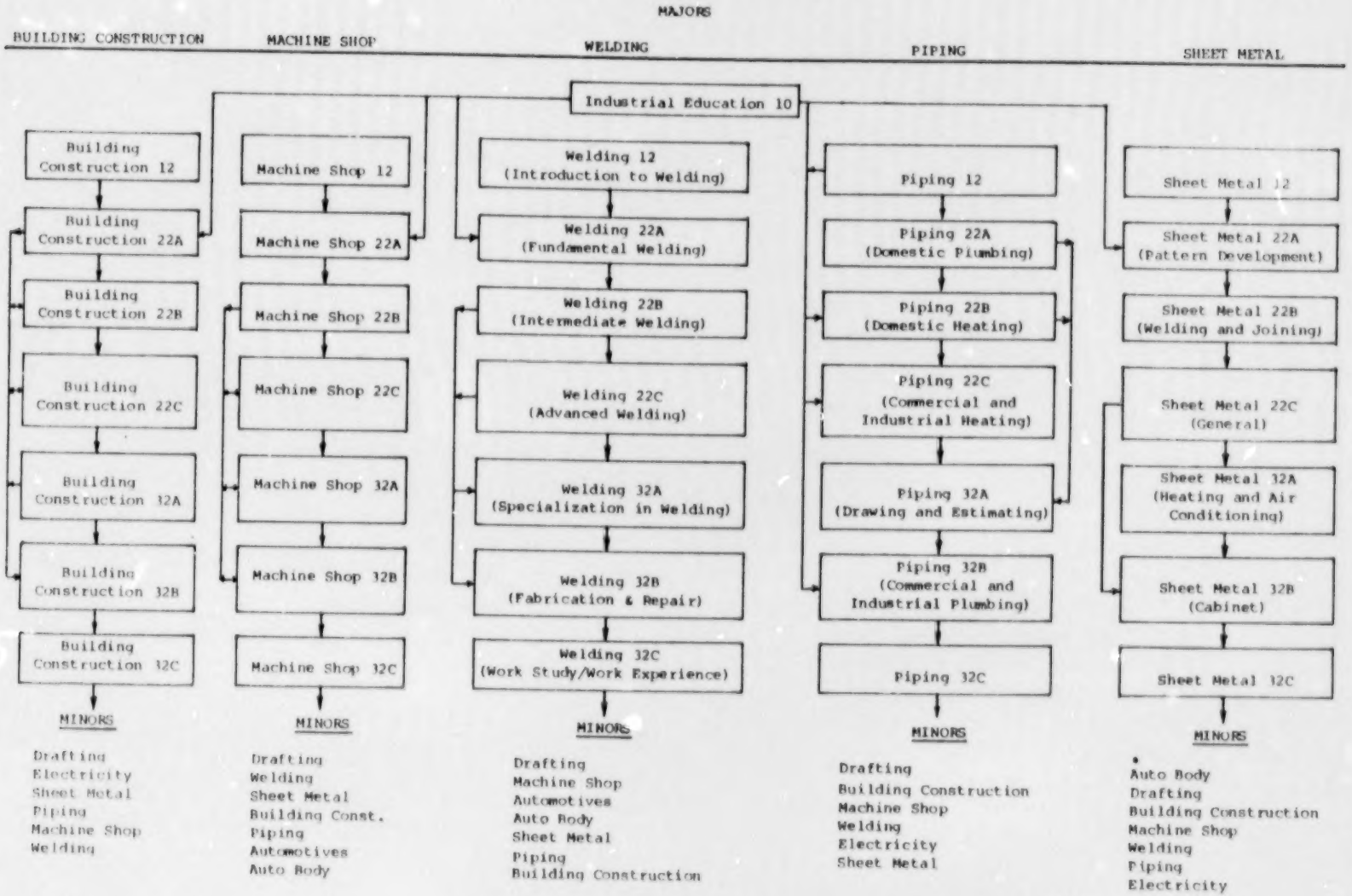
NOTE: Careful course selection could give the student the option of choosing from two majors at the 22 level, OR

b. A student wishing to establish a prerequisite to a 22 course may take one half of two 12 courses.

e.g. Industrial Education 10 (5 credits)
- ½ Beauty Culture 12 course, PLUS
- ½ Food Preparation 12 course gives a prerequisite for a Beauty Culture 22 course and for a Food Preparation 22 course.

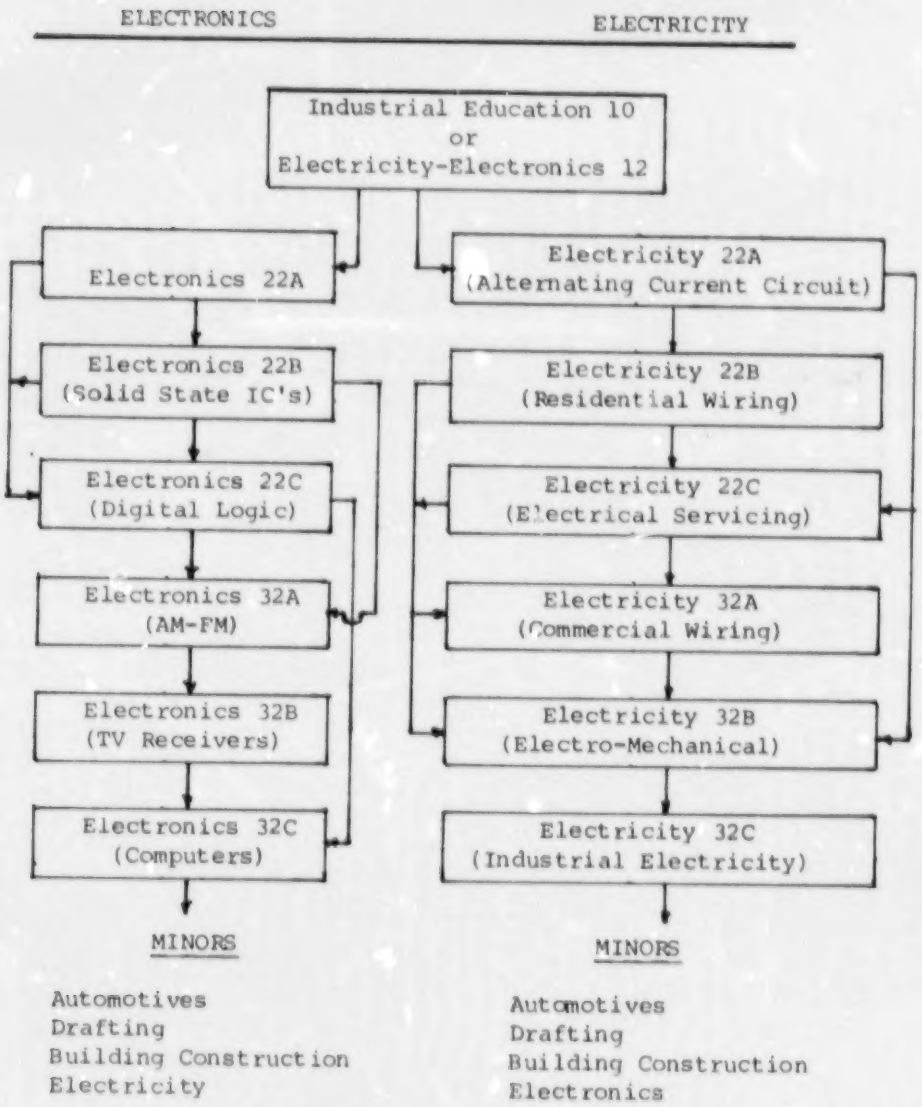
NOTE: Careful course selection could give the student the option of choosing from two majors at the 22 level.

Career Field - CONSTRUCTION AND FABRICATION



Career Field - ELECTRICITY-ELECTRONICS

MAJORS



MINORS

Automotives
Drafting
Building Construction
Electricity

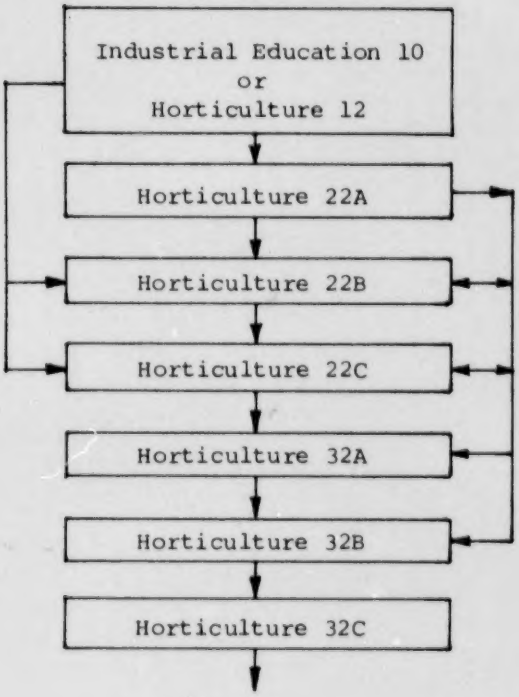
MINORS

Automotives
Drafting
Building Construction
Electronics

Career Field - HORTICULTURE

MAJOR

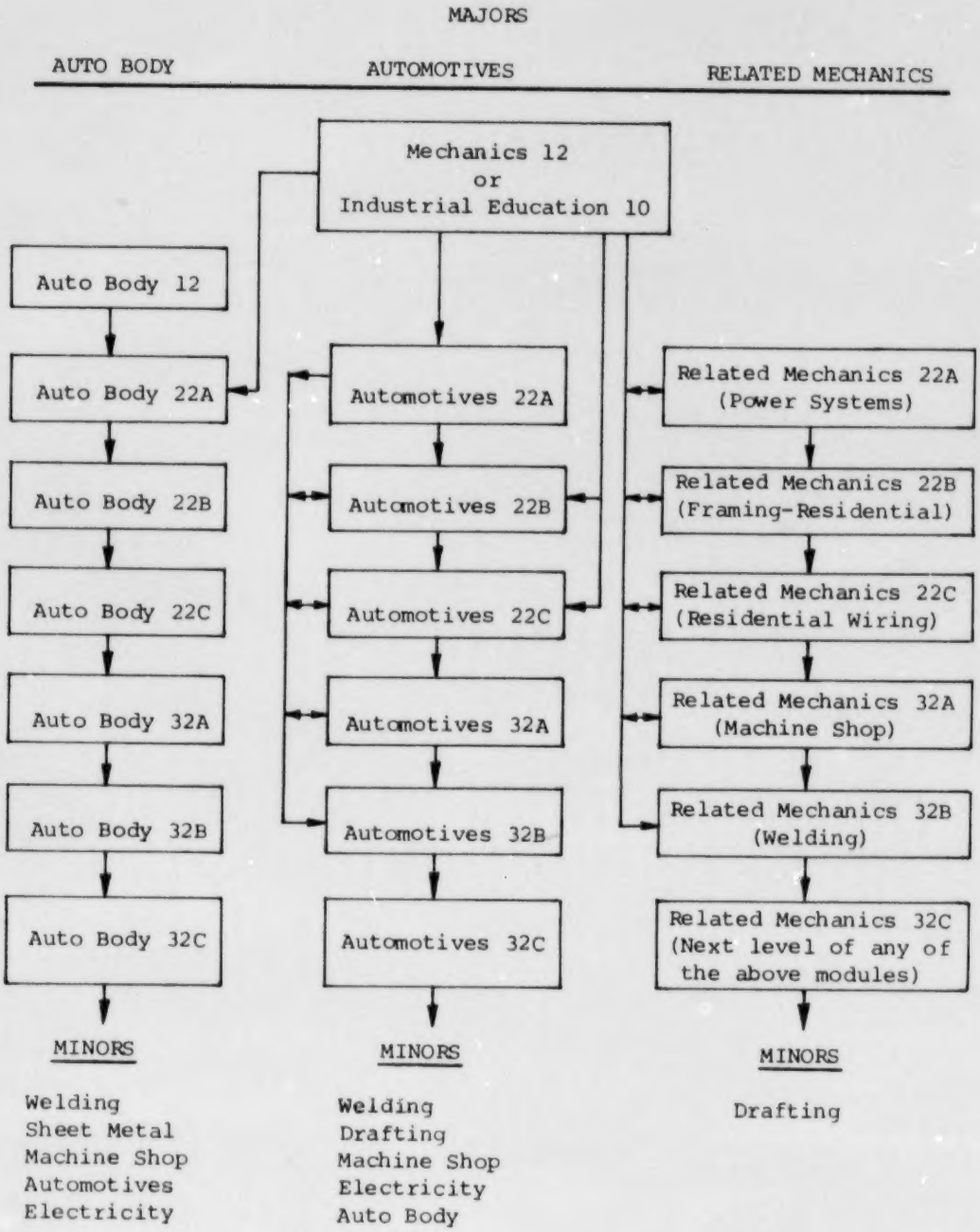
HORTICULTURE



MINORS

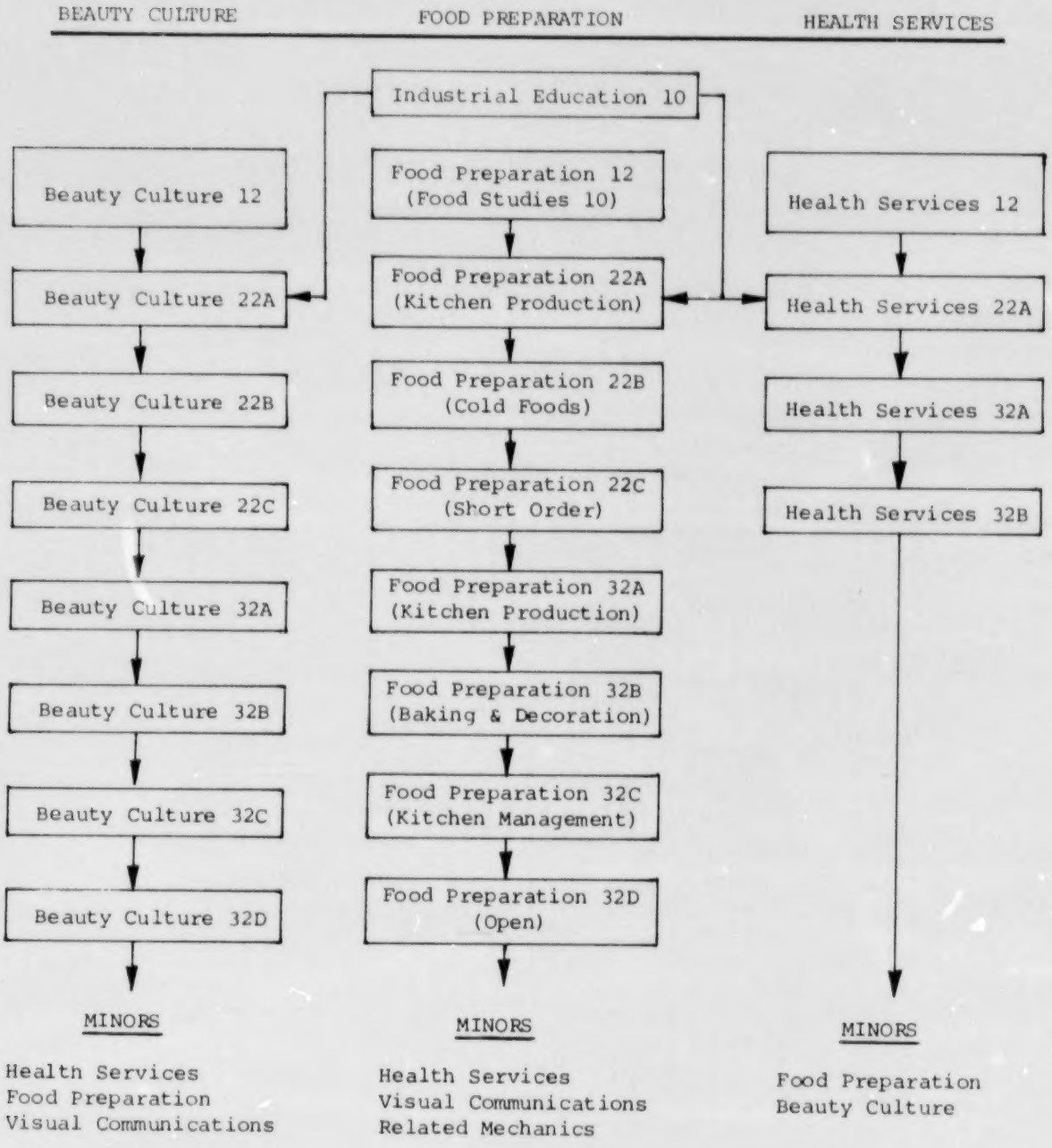
Drafting
Automotives
Building Construction
Related Mechanics
Electricity
Piping

Career Field - MECHANICS



Career Field - PERSONAL SERVICES

MAJORS



MINORS

Health Services
Food Preparation
Visual Communications

MINORS

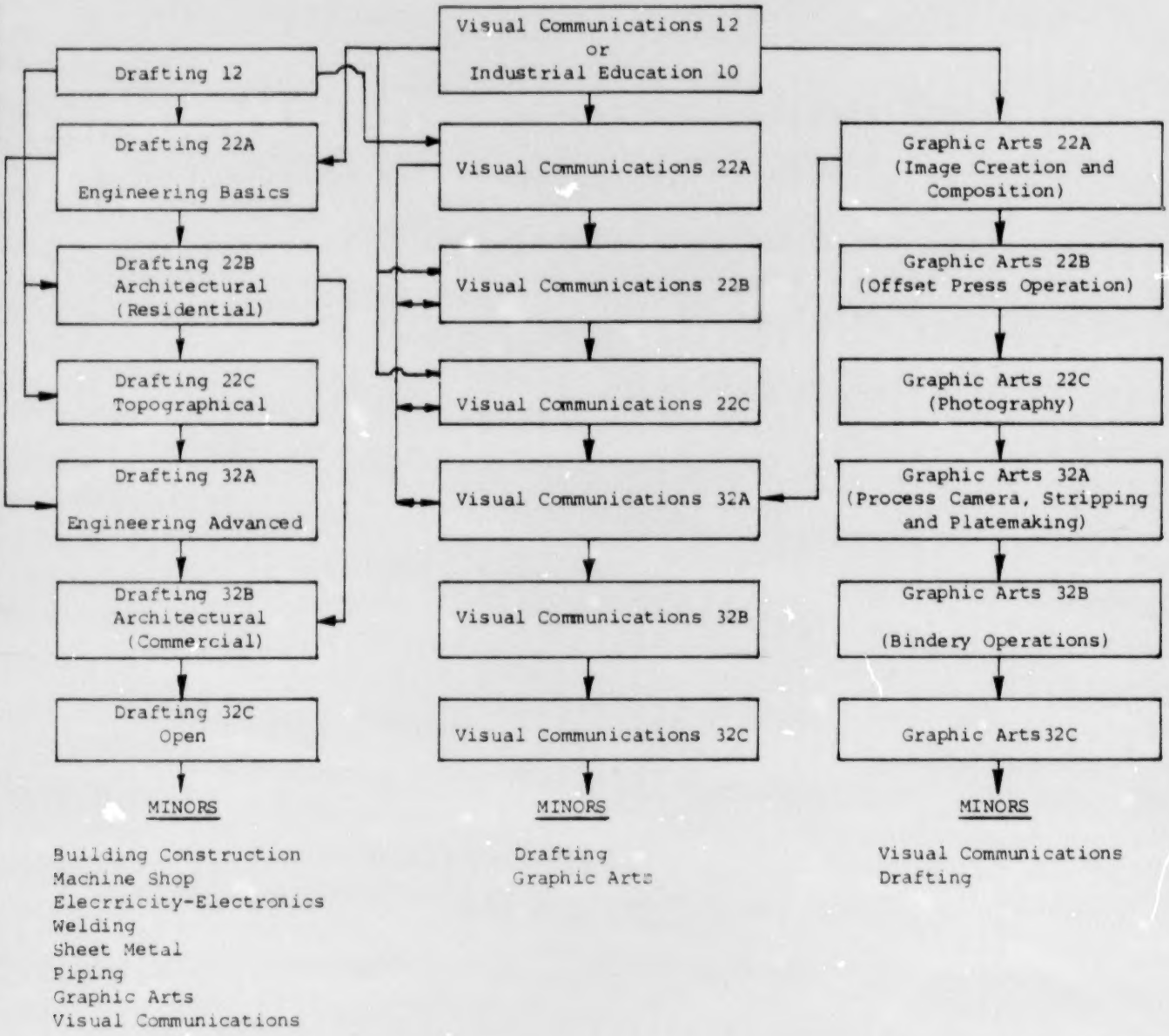
Health Services
Visual Communications
Related Mechanics

MINORS

Food Preparation
Beauty Culture

Career Field - VISUAL COMMUNICATIONS

MAJORS



MINORS

Building Construction
Machine Shop
Elecrricity-Electronics
Welding
Sheet Metal
Piping
Graphic Arts
Visual Communications

MINORS

Drafting
Graphic Arts

MINORS

Visual Communications
Drafting

3. Articulation

(1) Recognition of Alberta Vocational High School subjects by the Institutes of Technology and Community Colleges

Advance credit may be granted by an institution on the basis of proof of successful completion of a high school vocational program (Business or Technical) and/or obtaining a passing grade in an institution-administered entrance examination.

Because of the necessity of arranging for individualized programs, a student wishing to take advantage of these articulation provisions must write to the Registrar of the Institute of Technology or Community College by April 15, giving details of the high school program completed and stating the post-secondary program he/she is interested in. The institutions involved will communicate with students regarding specific information.

(2) Articulation with the Alberta Apprenticeship Program

Some Vocational High School programs are similar in scope to the junior periods of some apprenticeship program. In particular, similarities prevail between:

Building Construction and Carpenter Apprenticeship
Electricity and Electrician Apprenticeship
Pipe Trades and Plumber Apprenticeship
Pipe Trades and Steamfitter Apprenticeship
Automotives and Motor Mechanic Apprenticeship
Auto Body and Auto Body Mechanic Apprenticeship
Sheet Metal and Sheet Metal Mechanic Apprenticeship
Machine Shop and Machinist Apprenticeship
Electronics and Electronics Technician Apprenticeship
Electronics and Communication Electrician Apprenticeship
Welding and Welder Apprenticeship
Food Preparation and Cook Apprenticeship
Beauty Culture and Beautician Certification

a. A person who presents to apprenticeship authorities of Alberta Manpower one hundred high school credits, including at least 35 credits in one of the above high school programs (excepting Beauty Culture) and an acceptable application for apprenticeship in the corresponding apprenticeship program, may be granted apprenticeship credits on the following basis:

i. For Building Construction, Electricity, Automotives, Machine Shop, Electronics, Plumber and Steamfitter - upon recommendation of employer, one year of time credit (three months shortening of each of four 12-month periods) and first and second period technical credit upon passing the examination for these periods.

ii. For Electronics into the Communication Electrician Apprenticeship - upon recommendation of the employer, credits arranged by evaluation of credentials, as there are four "craft" areas in the apprenticeship program beyond the first period level.

iii. For Welding and Food Preparation - upon recommendation of employer, one year of time credit (four months shortening of each of three 12-month periods) and first period technical credit upon passing the first year examination.

iv. For Auto Body - upon recommendation of the employer, one period of time credit (600 hours shortening of each of the three 2100 hour periods) and first period technical credit upon passing the examination.

v. Sheet Metal - upon recommendation of the employer, one period of time credit (450 hours shortening of each of four 1800 hour periods) and first and second period technical credit upon passing the examination for these periods.

b. A person who presents fewer than 100 high school credits with a minimum of 35 credits in one of the above named vocational programs, or a person who presents 100 high school credits with fewer than 35 credits in one of the above vocational programs, may expect to be considered for lesser apprenticeship credit on the basis of individual performance upon undertaking apprenticeship.

c. A person who presents proof of 1400 hours scheduled instruction in Beauty Culture in a vocational high school is eligible for examination for the Certificate of Proficiency as a beautician, provided that instruction is given by a certified beautician. Persons who complete fewer than 1400 hours of scheduled instruction may fulfill the requirements in a private beauty culture school as a student or in a beauty culture salon as a registered apprentice.

NOTE: Vocational High School credits acceptable for articulation with apprenticeship programs may be altered from time to time due to changes in programming recommended by Provincial Apprenticeship Committees.

Information about apprenticeship programs is contained in the brochure "Apprenticeship Opportunities" available from the Apprenticeship and Trade Certification Branch Regional Offices at:

- Parkside Office Building
  10926 - 119 Street
  EDMONTON, T5H 3P5

- 6th Floor, Alberta Place
  1520 Fourth Street S.W.
  CALGARY, T2R 1H5

- 2nd Floor, Provincial Bldg.
  200 - 5th Avenue S.
  LETHBRIDGE, T1J 4C7

- 3rd Floor, West, Provincial Bldg.
  4920 - 51 Street
  Box 5002
  RED DEER, T4N 5Y5

- 7th Floor, West Tower
  Jubilee Centre
  9915 Franklin Avenue
  FORT MCMURRAY, T9H 2K5

- 1601 Provincial Building
  10220 - 99 Street
  GRANDE PRAIRIE, T8V 2L8

- 2001 Provincial Bldg.
  4701 - 52 Street
  VERMILION, T0B 4M0

- 2nd Floor, Hinton Centre
  Pembina Avenue
  HINTON, T0E 1B0

- Provincial Building
  9621 - 96 Avenue
  Box 28, Bag 900
  PEACE RIVER, T0H 2X0

- 208A Provincial Bldg.
  770 - 6 Street, S.E.
  MEDICINE HAT, T1A 4J6

V. DESCRIPTION OF COURSES

1. Industrial Education 10, 20, 30

Industrial Education 10, 20, 30 is a program consisting of fifty-six modules. Each module may be taught for a minimum of 25 hours to a maximum of 33 hours. This allows a school some flexibility in organizing a 4-5 credit course utilizing their labs to advantage. Also it provides the necessary time for a student to get the prerequisite for a "22" course by taking two modules for 65 hours combined.

The chart on page 13 shows how the modules can be classified into career fields. Programming can be done vertically by selecting modules from a single field or horizontally by selecting modules from many fields.

In a multiple activity laboratory, a course will likely consist of modules selected from three or four fields.

The Industrial Education 10, 20, 30 program can be integrated with the "22" program or can be used to provide students with more indepth experiences than were possible through their junior high school orientation program.

A. ELECTRICITY-ELECTRONICS - COMPUTER

1. Electricity
   The content of this module introduces the student to basic electrical theory, control of the power of electricity, and basic tool and instrument use.
2. Electronics
   In addition to basic theory students will begin to unravel the mystery of electronics by using test instruments and electronic devices.
3. Equipment Servicing
   Students will be taught how to use appropriate instruments in a logical sequence to determine apparatus failure. They will repair and test equipment.

4. Logic Circuits

   This module will help the students progress from basic concepts of digital electronics to the more sophisticated circuitry by actual hands-on involvement.

5. Computer Systems

   This module will give the students an introductory course in how a computer works.

6. Introduction to Computers

   The students obtain an understanding of the operation and common applications of the computer and how it can be utilized in our society.

7. Computer Programming - Introductory

   Students are introduced to a simple computer language commonly used in micro-computers.

8. Computer Programming - Industrial Applications

   Students learn how to program a computer and harness it to industrial applications.

9. Communications - Introductory

   This module will provide the content for students to understand the theory of amplification and to assemble an amplifier.

10. Communications - Systems

    Students learn about various audio systems and how they are assembled.

11. Electronic Design

    The students should become familiar with the actual workings of an electronic system(s) through practical activities.

12. Electronic Construction

    This module will give the students the opportunity to study the importance of planning, organization and quality control as they assemble their own project from their own layout.

B. MATERIALS

1. General Woods

   Content includes the safe use of tools and basic shaping and joining of wood

2. Building Construction 1

   Simple framing and safe tool use are studied and practiced.

3. Building Construction 2

   Students become acquainted with the various fields in the sub-trades and gain a general knowledge of materials, tools and processes utilized in these fields.

4. Cabinet Construction 1

   Safe use of tools and equipment is taught while performing exercises in shaping and joining parts of wood projects. Basic joining is practiced.

5. Cabinet Construction 2

   Content includes procedures and practices used in building box furniture, kitchen cabinets and finishing methods.

6. General Metals

   This module provides students with exploratory experiences in a number of metal forming and fabricating processes. Both hand and machine tools are used.

7. Sheet Metal

   Students learn how to make simple layouts, the use of shearing tools, forming methods and how to assemble and fasten the parts of sheet metal projects.

8. Machine Metal

   This module introduces the student to the machine lathe, drill, grinder and shaper. Correct procedures are taught for setting up and making basic cuts.

9. Arc Welding

   Students learn how to set the welder for various type of rods and metal weights. Basic techniques and welding forms are practiced.

10. Oxy-Acetylene Welding

    The content includes safe procedures for setting up the equipment and making adjustments. Basic oxy-acetylene procedures and techniques are practiced.

11. Foundry

    This module will give the student an opportunity to try the different processes involved in foundry from pattern making to finishing a casting.

12. Earths

Students learn about the manufacture of clay products and practice forming clay products using both hand and molding procedures. They learn about the mixing of concrete and forming methods.

13. Plastics 1

The first module in plastics deals with cutting, finishing and assembling plastic products as well as the construction of molds and using them to form plastics.

14. Textiles

Students will learn how to select fabrics for various purposes; how to select and care for clothing and how to construct several simple projects from fabrics.

15. Foods

Students learn about safety and sanitation in the kitchen; how to prepare a simple meal and the principles of meal preparation with reference to nutrition and costs.

C. POWER

1. Conventional Heat Engines

Students study and operate several internal and external combustion engines to learn about safety procedures, efficiency, control and energy utilization.

2. Small Engine Repair

This is a continued study of small engines. Proper procedures for troubleshooting, systems analysis and component replacement are taught.

3. Small Engine Tune-Up and Troubleshooting

Students work with small engines learning about basic operating principles, tool use, adjustments and minor repairs.

4. Mechanical Systems

This module provides the student with the experience of dismantling and re-assembling various mechanical systems to determine operating principles.

5. Non-Conventional Power Sources

   Other sources of energy such as solar, chemical, wind, etc. are studied.

6. Electrical and Electronic Systems

   Content includes the production of electricity, amplification control, measurement and transmission.

7. Electro-mechanical and Electronic Control

   Students study conversion and control of energy as it applies to electric starters, generators and alternators. Ignition systems and electrical appliances are studied.

8. Appliance Repair and Troubleshooting

   Students will learn troubleshooting procedures as they repair typical appliance faults.

9. Automobile Maintenance

   This module covers the major systems in the automobile, safety, tires, lights and general maintenance.

10. Fluid Power

    Students will assemble, operate and analyze different hydraulic and pneumatic systems and learn about efficiency of energy transfer.

11. Automobile Tune-Up

    Students identify engine parts and use tools and instruments to tune up an engine. Ignition and carburation are studied.

12. Automobile Repair

    Students will practice diagnostic procedures to identify problems before repairing or replacing parts.

13. Automobile Ownership

    Students learn how to evaluate a used car before purchase and learn about the responsibilities ownership brings with it.

D. VISUAL COMMUNICATIONS

1. Introduction to Offset Lithography

   Content includes basic principles of the lithographic process, simple layouts, making masters and offset press operation.

2. Process Photography - Line

   Students use the process camera to do line photography and prepare orthochromatic film to make metal masters.

3. Process Photography - Halftone

   This is a continued study of process camera operation, stripping and platemaking. The module on line photography should precede this one.

4. Layout and Design

   Students will develop skill in layout and commercial art techniques.

5. Topographical Drafting and Architectural Drawing

   Students draw contour maps and learn how to use various projections and how to do dimensioning. They will learn to read building plans and draw a simple plan.

6. Relief Printing

   Principles of relief printing will be studied and applied to hand setting type and use of a small platen press, sign press and rubber stamp machine.

7. Screen Process Printing

   Students learn to do screen process printing using both hand cut and photographic methods.

8. Black and White Photography

   Content includes the study of cameras, light sensitive materials and enlarger work.

9. Black and White Photography - Advanced

   The basic skills learned earlier will be enhanced with the study of advanced camera and darkroom techniques.

10. Color Photography

    Students study principles of color photography, properties of color film and techniques of development.

11. Mechanical Drafting

    Basic drawing concepts are introduced to produce product representations through various projection methods. Students learn to use and take care of instruments.

12. Customer Service

The organization and structure of industry is studied along with the production process and the problems encountered when producing a saleable product.

13. Offset Printing Production

Students plan a production run of a printed product and in the process learn about: systems analysis, quality control, offset production, deadlines, wastage and consumer acceptance.

E. GENERAL MODULES

1. Research

The research module is intended for individual student use. It provides a 25 hour module to allow a student to expand on an interest related to the Industrial Education program.

2. Developmental

Content in Industrial Education is constantly changing. This module is intended for teachers' use in developing new areas of knowledge not attended to by the current curriculum in Industrial Education. Teachers intending to develop and experiment with new content should discuss this with one of the provincial Industrial Education Consultants before exposing students to it.

3. Production Science

This module provides a 25 hour block of time to set up a simulated industrial experience. The concepts can be drawn from the Production Science 30 course which is a much expanded version of the same processes.

2. Industrial Education 12, 22, 32 Course Descriptions

Industrial Education 12, 22, 32 is a program made up of five credit modules. The sequencing of these modules is fairly flexible, but should be in conformity with the charts on pages 18 to 23.

Students who fail a prerequisite module cannot go on in the course until it is completed satisfactorily.

While these modules are vocational in content, students still have a choice as to the number they wish to complete. However, to take full advantage of the Apprenticeship Articulation thirty five (35) credits must be completed.

A. GRAPHIC COMMUNICATIONS

The career field of Graphic Communications includes: drafting, graphic arts and visual communications. Students may build a program by selecting appropriate modules from the various areas or concentrate on one.

a. Drafting

1. Drafting 12 (1864)

An introductory course which develops basic skills in the use and care of instruments, sketching, lettering, pictorial drawing, orthographic drawing, dimensioning and career information.

2. Drafting 22A (Engineering Basics) (2864)

The course concentrates on machine drawing, shape descriptions, fastening methods and working drawings.

3. Drafting 22B (Architectural Drafting) (2865)

An introduction to architectural drawing dealing with design, materials, building standards and working drawings.

4. Drafting 22C (Topographical Drafting) (2866)

This course in topographical drawing introduces the students to surveying, photogrammetry, interpretation of field notes and photographs, map drawing, symbols and map projections.

5. Drafting 32A (Engineering Advanced) (3864)

Engineering graphics develops the concepts learned in machine drawing (22A). Activities include multi-view drawings, auxiliary views, descriptive geometry, vector geometry, industrial systems, power transmission systems, and white printing.

6. Drafting 32B (Architectural Commercial) (3865)

This is the second course in architectural drawing with emphasis on the design of light commercial facilities.

7. Drafting 32C (3866)

This course consists of content taken from related fields such as construction and fabrication to provide the student with practical activities related to his drafting.

b. Graphic Arts

1. Visual Communications 12 (1736)

Visual Communications is a course common to the three major areas in the career field. Students will learn about occupational opportunities, basic drawing, composition and design, color theory, lettering, advertising layout, photography, platemaking, printing and finishing procedures.

2. Graphic Arts 22A (Image Creation and Composition) (2904)

The course explores the areas of offset printing, layout and design, pasteup, typesetting and typography.

3. Graphic Arts 22B (Offset Press Operation) (2905)

In this course the work relates to the press; maintenance, preparation and operation and the various inks and their uses.

4. Graphic Arts 22C (Photography) (2906)

The course includes use of different types of cameras, properties and development of light sensitive materials and the operation of the enlarger.

5. Graphic Arts 32A (Process Camera, Platemaking) (3904)

Students learn to use the process camera and gain experience in stripping and platemaking.

6. Graphic Arts 32B (Basic Bindery Operations) (3905)

Students learn to bind and finish a project.

7. Graphic Arts 32C (3906)

This module allows for advanced project work, review of processes learned or work study in industry.

c. Visual Communications

1. Visual Communications 12 (1736)

Visual Communications is a course common to the three major areas in the career field. Students will learn about occupational opportunities, basic drawing, composition and design, color theory, lettering, advertising layout, photography, platemaking, printing, and finishing procedures.

2. Visual Communications 22A (2737)

Visual Communications 22A is a course to provide practical experiences for the student to learn the necessary terminology, tools and techniques of illustration, photography, and printmaking in order to communicate ideas and information with accuracy and individuality.

3. Visual Communications 22B (2738)

Visual Communications 22B provides the student with a working understanding of photo-illustration and its application to the communication process. This module may be taken by a student following one of the introductory courses, namely: Visual Communications 12, Industrial Education 10 or Drafting 12.

4. Visual Communications 22C (2739)

Visual Communications 22C provides the student with an understanding of the interrelationship of commercial art and other areas of visual communications. Students may take Visual Communications 22C after completing Visual Communications 12, Industrial Education 10 or Drafting 12.

5. Visual Communications 32A (3737)

Visual Communications 32A is designed to provide increased skill development in graphic design and processes in order to communicate ideas and information with accuracy and originality. Students may take Visual Communications 32A following Visual Communications 22A or Graphic Arts 22A.

6. Visual Communications 32B (3738)

The Visual Communications 32B module is designed to provide the student with a basic understanding of the journalism process. This module may be taken any time after completion of the 22A module.

7. Visual Communications 32C (3739)

Through this course students may increase their competencies in areas covered previously by doing additional work in the school or by engaging in actual art work for a commercial firm. Students must be under the supervision of the Visual Communications teacher and a craftsman on the job.

B. MECHANICS

The career field of Mechanics includes automotives, auto body, and related mechanics. Students may build a program by selecting modules from one or more of the areas.

a. Auto Body

1. Auto Body 12 (1816)

An introductory course which includes activities in occupation and safety studies, use of tools and processes in body work, welding and painting.

2. Auto Body 22A (2816)

Activities include shop operations, tool use, welding and metal finishing.

3. Auto Body 22B (2817)

Students learn to use terms of the trade, learn how to shape components and do more advanced work in alignment, jacking, welding and door repairs.

4. Auto Body 22C (2818)

Management problems are studied. Activities include: metal cutting, brazing, welding, bumper repair, frame repair, repairing dents and painting (practice panel), plastic repair.

5. Auto Body 32A (3816)

Advanced work is done in assessing damage, writing up estimates, spray painting, fitting components and metal finishing.

6. Auto Body 32B (3817)

Advanced work is continued in management, electrical circuitry, painting frame alignment, welding and interior repair.

7. Auto Body 32C (3818)

Students may increase their skills by shop practice in the school or on the job training in an auto body shop. The student must be supervised by the Auto Body teacher as well as by a journeyman on the job.

b. Automotives

1. Mechanics 12 (1746)

Mechanics 12 is an introductory course leading to all the major areas in the career field of mechanics. Students are introduced to power sources and methods of transmission. They study the concepts of work, energy and power and engage in the activities of testing, disassembly and assembly of machines, reading, research and applying information learned to analyzing and repairing minor engine problems.

2. Automotives 22A (Power Systems) (2824)

This course combines theory and practice in the maintenance and repair of suspension, steering and braking systems.

3. Automotives 22B (Power Train) (2825)

Theory, practice and service are studied as related to the power train components of clutches, transmission, drive line, rear axle and introduction to automatic transmission.

4. Automotives 22C (Electrical Systems) (2826)

This course combines theory and practice in the maintenance and repair of the internal combustion engine. Activities include procedures in problem analysis, disassembly, repair and assembly.

5. Automotives 32A (Fuel and Tune-up) (3809)

This course is a study of the fuel, ignition and exhaust systems, their components, analysis and tune-up.

6. Automotives 32B (Engines) (3810)

This course combines theory and practice in the maintenance and repair of the internal combustion engine. Activities include procedures in problem analysis, disassembly, repair and assembly.

7. Automotives 32C (3811)

Students may increase their competencies in any of the major areas of study previously taken by more school shop practice or may train on the job under the supervision of the Automotives teacher and a journeyman.

c. Related Mechanics

Related Mechanics is a program designed to meet the needs of students planning careers in the agricultural sector of the Alberta economy. Entry into the program is through Mechanics 12 or Industrial Education 10.

1. Mechanics 12 (1746)

Described under Automotives, page 38.

2. Related Mechanics 22A (Power Systems) (2809)

This course combines theory and practice in the maintenance and repair of the internal combustion engine.

3. Related Mechanics 22B (Building Construction) (2810)

A study is made of materials and methods of construction used for erecting frame buildings such as a granary, barn, garage or house. Activities include the uses of hand and power tools in the construction of a frame building.

4. Related Mechanics 22C (Electricity) (2811)

This course is a study of the theory and application of electricity to residential wiring.

5. Related Mechanics 32A (Benchwork & Lathe Operation) (2309)

Related Mechanics 32A is designed to provide the student with theory and practice in: Safety, machine maintenance, blueprint reading, layout and measurement, benchwork, machine tools, basic metallurgy and occupational information.

6. Related Mechanics 32B (Welding) (3810)

This course includes the theory and practice of both oxy-acetylene and electric arc welding.

7. Related Mechanics 32C (3811)

Advanced study may be continued of any of the topics covered in the courses listed under related mechanics or on the job training under the supervision of the Related Mechanics teacher and a journeyman on the job. One developmental module may be used to replace any one of the listed modules above.

C. CONSTRUCTION AND FABRICATION

The career field of Construction and Fabrication includes: building construction, machine shop, welding, piping and sheet metal.

a. Building Construction

1. Building Construction 12 (Carpentry) (1836)

This introductory course provides theory and practice in the use of hand and power tools, planning and design, and materials. Students will have an opportunity to make projects related to the theory.

2. Building Construction 22A (Cabinet and Furniture Making) (2836)

This is a course in cabinet and furniture construction. The theory and practice emphasize design, materials, tools and processes.

3. Building Construction 22B (Concrete and Form Construction) (2837)

The course deals with concrete as a material of construction and relates theory to practice in design, form construction and concrete replacement.

4. Building Construction 22C (Residential Framing) (2838)

The course outlines the theory and practices used in framing a house. Students may frame a small building.

5. Building Construction 32A (Exterior Finishing) (3836)

This module aims primarily at introducing the student to exterior finishing in residential construction. Although Blueprint Reading, Drawing and Sketching has been dealt with in other modules, it should be pursued in greater depth in this module. Students may register in Building Construction following completion of one of Building Construction 12, or Industrial Education 10.

Emphasis should be placed on student activity through on-site projects or mock-ups.

6. Building Construction 32B (Interior Finishing) (3837)

The course provides theory and practice in selecting materials, tool use, design and construction methods for doors, cabinets, closets, interior trim, stair construction and finishing with paints and varnishes.

7. Building Construction 32C (3838)

Students may pursue any of the topics in previous courses in greater depth or take further training on the job under the supervision of the Building Construction teacher and a journeyman.

b. Machine Shop

1. Machine Shop 12 (1936)

The course provides theory and practice in: layout and bench work, operation of the lathe, shaper, drill press, power saw and grinder. It gives an introduction to metallurgy.

2. Machine Shop 22A (2936)

This course provides theory and practice in the safe use of hand tools, lathe, drill press, power saw and milling machine to shape metal by removal.

3. Machine Shop 22B (Lathe, Milling and Grinding) (2937)

This course continues from the experience in 22A with the theory and practice of advanced lathe work, the introduction of the milling machine and grinder.

4. Machine Shop 22C (Advanced Machining) (2938)

Content and practice advance to precision measuring and machining, cutting threads, tapers, keyways, gear cutting and heat treating.

5. Machine Shop 32A (Construction and Fabrication) (3936)

Machine Shop 32A is a relatively advanced module requiring an understanding and an ability to practice the required basic operations in a machine shop. Besides the reinforcement of the basics this module concentrates on non-ferrous metals, forms of materials, advanced turning operations, horizontal and vertical milling and grinding.

6. Machine Shop 32B (Advanced Machinery Operation) (3937)

Machine Shop 32B provides the students with an orientation to surface finishing, welding specifications and symbols. The students get experience in using machinery's handbook to solve various trade problems. They also learn the theory and practice of such concepts as: heat treating, jigs and fixtures, special machine operations and patents.

7. Machine Shop 32C (3938)

Students may pursue any of the topics listed in greater depth or take further training on the job under the supervision of the Machine Shop teacher and a journeyman on the job.

c. Welding

1. Welding 12 (1980)

The course deals with occupational information, safety, and the theory and practice of arc and oxy-acetylene welding.

2. Welding 22A (Fundamental Welding) (2980)

Practice is given in both oxy-acetylene and electric arc welding utilizing exercises, repair work and projects.

3. Welding 22B (Intermediate Welding) (2981)

A continuation of skill development.

4. Welding 22C (Advanced Welding) (2982)

Advanced work is given in special electric arc applications such as welding non-ferrous metals, hard surfacing and specialty welding.

5. Welding 32A (Specialization in Welding) (3980)

The course involves blueprint reading, welding with the gas metallic arc process and using templates related to fabrication of pipe joints.

6. Welding 32B (Fabrication and Repair) (3981)

The course emphasizes design, fabrication and repair.

7. Welding 32C (3982)

Students may develop skills at the school through in-depth studies or engage in training on the job in a welding shop under the supervision of the Welding teacher and a journeyman welder.

d. Piping

1. Piping 12 (1949)

The course gives theory and practice in safety, measurement and layout, joining pipe, fittings and valves. Occupational opportunities and qualifications are studied.

2. Piping 22A (Domestic Plumbing) (2949)

The course gives the theory and practice necessary to plumb a house.

3. Piping 22B (Domestic Heating) (2950)

The course consists of the study of hot water heating, installing gas lines and servicing gas controls.

4. Piping 22C (Commercial and Industrial Heating) (2951)

Systems used in commercial heating and methods of installation are studied.

5. Piping 32A (Drawing and Estimating) (3949)

Plans for a plumbing installation are drawn using correct lines and symbols complete with the estimate of the cost.

6. Piping 32B (Commercial and Industrial Plumbing) (3950)

The course relates theory and application of the plumbing code to roughing in and setting the fixtures on a job.

7. Piping 32C (3951)

Advanced work on topics covered may be continued in the school shop or the student may engage in training on the job under the supervision of the Piping teacher and a journeyman.

e. Sheet Metal

1. Sheet Metal 12 (1968)

Sheet Metal 12 is an introduction to the career of the sheet metal worker, qualifications required and work organization. Theory and practice is given in layout, cutting, forming and pattern development.

2. Sheet Metal 22A (Pattern Development) (2968)

This course emphasizes the theory and application of the principles of sheet metal layout.

3. Sheet Metal 22B (Joining) (2969)

Content includes: mechanical joining methods, adhesive and cohesive methods, with practice in all.

4. Sheet Metal 22C (General Sheet Metal Work) (2970)

The fabrication of rectangular, cylindrical and conical objects provide the activities of this course.

5. Sheet Metal 32A (Heating and Air Conditioning)

A complete study is made of an air conditioning and a heating system.

6. Sheet Metal 32B (Cabinet Work) (3969)

Students fabricate furniture or fixtures made of sheet metal.

7. Sheet Metal 32C (3970)

Advanced work may be engaged in at the school or a student may train on the job under the supervision of the Sheet Metal teacher and a journeyman in the trade.

D. ELECTRICITY-ELECTRONICS

The career field of Electricity - Electronics includes electricity and electronics. Students may select courses from either area, within the restraints of prerequisites to build a program.

a. Electricity

1. Electricity - Electronics 12

This course introduces concepts basic to the whole field of electricity - electronics. It deals with: occupational information, safety, nature of electricity, magnetism and electric-magnetism, electrical measurement, circuitry and electrical systems.

2. Electricity 22A (2880)

This course provides basic theory necessary for advanced work in electricity. Topics include: alternating voltage and current, inductance, capacitance, circuitry, semi-conductors, transistors and power supplies.

3. Electricity 22B (Residential Wiring) (2881)

The course deals with the theory and skills required to wire a house. The content includes basic electrical theory, code requirements, house circuitry, tool usage, and practice in wiring a building.

4. Electricity 22C (Electrical Servicing) (2882)

This course includes content on service equipment and tools, troubleshooting techniques, service procedures and practice in appliance repairing.

5. Electricity 32A (Commercial Wiring) (3880)

Content of this course includes: drawing plans for electric wiring, wiring methods, wiring hardware, tool and equipment use, control equipment and practical experience in all phases of commercial wiring.

6. Electricity 32B (Electro-Mechanical) (3881)

Course content includes theory of and practice with: generators, A.C. and D.C. motors and transformers.

7. Electricity 32C (3882)

Students may increase their competencies in areas covered previously in the Electrical program or engage in electrical work in industry by means of a program co-ordinated by the Electricity teacher and under the supervision of a journeyman on the job.

b. Electronics

1. Electricity-Electronics 12 (1731)

This is a course common to Electricity and Electronics. See description on page 44.

2. Electronics 22A (2888)

The course provides a background in the basic principles of active and reactive circuits and their application. Skills are developed and practiced in the use of test instruments.

3. Electronics 22B (Solid State) (2889)

This course introduces the student to solid state electronics. The design of and testing of solid state circuitry is studied and applied.

4. Electronics 22C (Digital Logic) (2890)

The course includes numbering systems, digital concepts, Boolean Algebra, codes and application of logic circuits in integrated circuits.

5. Electronics 32A (Radio) (3888)

The Electronics 32A course is designed to provide an opportunity for the students to study the theory and practice of radio communication. Students may elect Electronics 32A following completion of Electronics 22B or 22C.

6. Electronics 32B (T.V.) (3889)

This module is designed to provide students with a basic course on television receivers. Students have an opportunity to work with advanced electronic circuitry, of the type present in virtually all homes today.

Prior to registering in this module, it is recommended that students have a good understanding of basic electronic and electrical theory, be thoroughly familiar with basic lab test equipment, and have a good understanding of radio receiver operations and servicing.

7. Electronics 32C (Computer) (3890)

This module covers digital computers. It is designed to familiarize the student with the operation of the computer from both digital logic and programming viewpoints.

E. PERSONAL SERVICES

The career field of Personal Services includes beauty culture, food preparation and health services. Students may build a program for career development by selecting courses from the various fields within the constraints of prerequisites or concentrate on one major.

a. Beauty Culture

1. Beauty Culture 12 (1832)

The course provides occupational information and theory and practice as it relates to the following topics: ethics, maintenance of equipment, physiology, hairstyling, manicuring, hygiene and sanitation, skin care and make-up.

2. Beauty Culture 22A (2832)

Course content includes: hairstyling, setting, hair and scalp treatment, facials and make-up, shampoos, public hygiene and customer work.

3. Beauty Culture 22B (2833)

Course content includes: physiology, anatomy, skin diseases, permanent waving, advanced hairstyling, hair cutting and practice work.

4. Beauty Culture 22C (2834)

Course content includes: receptionist training, customer service, hair styling and coloring.

5. Beauty Culture 32A (3832)

Course content includes: color removal, hair bl[illegible]hing, fashion cuts and styles, cosmetic chemistry, customer se[illegible]e.

6. Beauty Culture 32B (3833)

The course gives practice in advanced work in hairstyling, coloring and straightening.

7. Beauty Culture 32C (3834)

Course content includes: esthetology, wigs, advanced hair coloring. The emphasis of these courses is customer service, skill development and competency in dealing with customers.

8. Beauty Culture 32D (3835)

Course content includes: salesmanship, merchandising, shop management, professional ethics, customer service.

b. Food Preparation

1. Food Preparation 12 (1896)

The course content outlines the opportunities in the food service industry, provides instruction in the use of cooking equipment, safety, sanitation, nutrition, menu planning and practical cookery.

2. Food Preparation 22A (2896)

The course content includes: vegetable cookery, stocks, soups, sauces, gravies and meats.

3. Food Preparation 22B (Cold Kitchen Production) (2897)

Contents of the course include: production of sandwiches and garnishes, salads, appetizers and desserts.

4. Food Preparation 22C (Short Order) (2898)

The course provides experiences in the preparation of beverages, eggs, utilization of dairy products, breakfast foods, and serving food.

5. Food Preparation 32A (Kitchen Production) (3896)

Students become involved in commercial type cooking operations and serving the public. Emphasis is placed on meat, fish, poultry, soups and salads.

6. Food Preparation 32B (Baking and Decorating) (3897)

Content relates to: baking ingredients, cakes, pastries and yeast doughs, desserts and decorating.

7. Food Preparation 32C (Kitchen Management) (3898)

Content includes: management, nutrition, purchasing, planning, costing and serving food. Part of the time may be spent in a commercial establishment.

8. Food Preparation 32D (3899)

Students may concentrate on special interest areas related to previous modules and/or work in a commercial food outlet under the supervision of the Food Preparation teacher.

c. Health Services

The Health Services program consists of a total of 20 credits. Students may couple this program with Business Education courses to develop a career field.

1. Health Services 12 (1961)

The content of this module is designed to introduce students to the various occupational areas in the health field as well as a study of home nursing. First aid is a vital part of the program.

2. Health Services 22 (2961)

This module deals with patient care procedures, anatomy and physiology, nursing practices, disease identification and safety practices.

3. Health Services 32A (3961)

Course content includes: nursing preparation for obstetrics, problems of patients, pediatrics and child care.

4. Health Services 32B (3962)

Content includes: introduction to medical and surgical nursing, gerontology and career exploration.

F. HORTICULTURE

1. Horticulture 12 (1916)

Horticulture 12 is an introductory course in the culture of indoor plants, commercial greenhouse plants, woody ornamentals, involving the maintenance and planning of various landscapes, controlling pests and diseases with the use of equipment and tools. Identification of common varieties of ornamental plants is included throughout the course.

2. Horticulture 22A (2916)

Horticulture 22A expands on the greenhouse production area of horticulture, including food production and ornamental plant materials and the internal structures operating in a greenhouse. Safety practices involved in greenhouse work are taught. A practical project is part of this module.

3. Horticulture 22B (2917)

Horticulture 22B develops skills in constructing and maintaining landscapes. The content deals with lawn care, tree care, soils, pest control, tools and horticultural equipment used in grounds maintenance.

4. Horticulture 22C (2918)

Historical aspects of design are integrated into the 22C module dealing with layout and planning of both residential and commercial horticultural areas. Landscape drafting, floral design and merchandising of floral crops is also a component of this module in order to develop artistic skills for the student.

5. Horticulture 32A (3916)

Horticulture 32A deals with commercial crop and nursery production. The emphasis is on major horticultural greenhouse crops

and on the production of woody ornamentals for and in a nursery. Students have a practical project to complete as well as extensive propagation and maintenance of plants.

6. Horticulture 32B (3917)

The emphasis in Horticulture 32B is on the theoretical aspects of production in relation to biology, organic gardening, food crop production and ecology of residential, public and commercial areas.

7. Horticulture 32C (3918)

The Horticulture 32C module is an intensive overview and expansion of the previous modules in Horticulture with particular emphasis on landscape construction, pesticide application equipment operation and business management. Work study is the major component consisting of 125 hours of practical experience in a horticultural industry.

VI. COURSES RELATED TO INDUSTRIAL EDUCATION

A. Production Science 30 (5 Credits) (3729)

Students learn about the organizational structure of industry, production processes and the various problems encountered in producing a saleable product or service.

B. Work Experience 15, 25 and 35 (1998, 2998, 3998)

Each of the three Work Experience Educational courses consists of 125 hours of time. Students are given some formal lessons on defining occupational interests, job interviewing, preparing a resume, deportment and related topics. The majority of the time is spent in a realistic work situation. The expectations for the Work Experience Education program are that students will:

1. have an opportunity to participate in meaningful work;
2. be enabled to explore career opportunities;
3. gain an understanding of the importance of developing acceptable work habits, good grooming, and a need for self-discipline;

4. develop an understanding of positive attitudes for getting along with people;
5. learn about organization of business and the relationships of employee to employer, unions, and government, through direct contact with these agencies;
6. assist students in making the transition from school to the world of work.

VII. SAFETY

Every lab/shop must have an effective safety program. Students must be taught, in each and every course studied within the Industrial Education framework, the "hows and whys" inherent in the safety program. It is the responsibility of the teacher to give continuous and vigilant supervision to ensure that all students are aware of and use safe practices. Information on safety education may be obtained from the Industrial Education Consultant in the Edmonton and Calgary Regional Offices.

VIII. ORGANIZATION FOR TEACHING

A. Teacher Qualification

First level courses identified by the numbers "10" or "12" may be taught by teachers of less than journeyman status but with competencies considered adequate by the school Principal and the Superintendent of Schools.

Second and third level courses identified as "22" and "32" must be taught by teachers qualified in the particular trade or technology as follows:

1. Journeyman certificate, or equivalent in the non-designated trade areas.
2. Valid teaching certificate.

B. Facility Standards

Facilities and staff used to teach senior career development courses for which Industrial Education grants are available must be approved annually by a Department of Education Consultant for Industrial Education. This approval is verified through the signature of the Consultant for Industrial Education on the "A" Form and a letter approving the courses and teachers listed on the "A" Forms.

IX. GRANTS

Vocational grants are available for programs of instruction:

1. including vocational major courses numbered 22, 32, 25 or 35, and which may include approved minor courses numbered 12 and 15,
2. which does not include courses commonly referred to as commercial electives or business education,
3. in which all courses are taught by teachers with approved trade qualifications, and
4. in which courses are part of an Academic-Occupations program which is approved annually by a Department of Education consultant for Industrial Education.

These regulations do not apply to:

a. boards of school districts established to educate pupils or children whose parents are employees of the Government of Canada, and
b. pupils or children whose parents reside in a school district described in clause (a) but who attend a school of another board.

X. ACADEMIC-OCCUPATIONAL PROGRAM GUIDELINES

GENERAL PURPOSE

The purpose of the Academic-Occupational Program is to provide an alternative to help students who have serious difficulty in keeping up with their peers in regular school courses. With the approval of their parents, these students may be placed in special classes designed to prepare them for direct entry into an occupation. Students and parents should be aware that not all courses in the Academic-Occupational program may earn credits toward a high school diploma. The regular requirements of a high school diploma must be met before a student can achieve that certificate.

OBJECTIVES

The objectives of the Academic-Occupational Program are:

a. to help students prepare themselves for entry into the world of work through vocational exploration and preparation;

b. to help students to develop a realistic self-image by experiencing success;

c. to help students develop living skills;

d. to help students to develop a value system that is congruent with societal norms.

CRITERIA FOR CANDIDATES

An Academic-Occupational Program means a program for a person:

a. who does not or is not expected to qualify for entry into a regular high school program because he/she has not achieved the necessary prerequisite courses or grades;

b. who has a record of low achievement;

c. who is thirteen years of age or older on September 1;

d. whose application is processed by a selection committee composed of the guidance counsellor, teacher-coordinator and superintendent (or designate).

e. who has the written consent of his/her parent or guardian;

f. who has been informed of the nature and expectations of the program.

PROGRAM CRITERIA

General Criteria: An acceptable A.O. offering is one:

a. which provides instruction in a provincially approved program of a vocational nature designed to prepare a person for entry into employment;

b. in which locally developed courses have received approval of Alberta Education before being introduced as part of the program (Section 11 (2)(b) of the School Act, 1970);

c. in which the class sizes do not exceed twenty students in the academic subjects and fifteen students in the laboratory and/or shop courses;

d. in which guidance and counselling are an integral part of the program;

e. which involves the coordination of efforts among different agencies such as other schools, manpower centres, social services;

f. which does not include credit courses beyond the Grade XI level.

PROGRAM COMPONENTS

The program for such students must have two components:

1. The Academic; regular courses may be modified or new ones developed locally to accommodate the needs of these students. Courses that are locally developed must receive the approval of Alberta Education prior to implementation. Academic courses must be directed toward improving the students' competencies in communication, computation and social relationships;

2. The Vocational; where Alberta Education programs of studies can be appropriately modified for Academic-Occupational students' use this should be done. Where no curriculum guide exists courses may be developed locally and be approved by Alberta Education. There are a number of locally developed courses already approved for specific districts. Other school districts wishing to obtain approval to use these courses are required to send a Board resolution to the Director of Curriculum. A minimum of ten credits or the equivalent in hours (250) must be made up of vocational preparation courses taught within the school.

The configuration of the vocational component of the program must meet the following stipulations depending on the length of the total program.

One Year Program

50% of the program must be in vocational preparation of which a minimum of 250 hours must be in-school vocational preparation.

Two Year Program

1st year - minimum of 250 hours in-school vocational familiarization.

2nd year - 50% of the program must be in vocational preparation of which a minimum of 250 hours must be in-school vocational preparation.

Three Year (or more) Program

1st year - minimum of 250 hours in-school vocational familiarization.

2nd year - 50% of the program must be in vocational preparation of which a minimum of 250 hours is in-school vocational orientation in a career field.

3rd year (or more) - 50% of the program must be in vocational preparation of which a minimum of 250 hours must be in-school vocational preparation.

FUNDING

Funding is based on the approval of a total program consisting of both the academic and vocational components. Each student in an approved Academic-Occupational program is entitled to a grant as stipulated in the vocational funding regulations.

APPROVALS

Academic-Occupational program offerings must be listed on the Form A.

Each school district must receive initial approval for the Academic-Occupational program offered there from the Consultant for Industrial Education, Alberta Education, and have the program reviewed every five years or sooner if changes to its content are made.